

AMENDMENTS TO THE CLAIMS:

The following Listing of Claims replaces all previous claims and listings of claims in the application:

LISTING OF CLAIMS:

18. (Previously Presented) An electric motor comprising:

one or more laminations of a metallic material forming an outer casing of the electric motor;

one or more circular non-metallic, flat, thermally conductive disks positioned between said laminations for conducting heat generated by an electrical current flowing within the motor through said conductive disks;

an electrically conductive material wound in a plurality of layers within the laminations so as to form an electric field that drives an armature when an electrical current is applied, thermally conductive strips interleaved between preselected layers of the electrically conductive material, said thermally conductive strip extending outside of the area covered by the electrically conductive material; and

means for conducting heat at the end of the non-metallic thermally conductive disk and the thermally conductive strips thereby cooling the motor.

19. (Previously Presented) A method for cooling electrical devices having layers of electrically conductive material wound on a core comprising the steps of:

placing a non-metallic thermally conductive strip having a first end and a second end, capable of conducting heat from between layers of the electrically conductive material, with said strip extending through at least some of the layers of electrically conductive material wound on the core with both said first end and said second end extending outside of an area covered by the layers of electrically conductive material; and

conducting the heat from the layers of electrically conductive material through the first and second ends of the non metallic thermally conductive material thereby cooling said electrical device.

20. (Previously Presented) A method as in Claim 19, further comprising the step of:
placing the non-metallic thermally conductive strip having a first and second end between a plurality of predetermined laminations of the core, said first and second ends of the non-metallic thermally conductive strip extending outside the core.

21. (Previously Presented) A method for cooling an electrical device having layers of electrically conductive material wound on to a laminated core having a heat generating component comprising the steps of:

placing one or more non-metallic, flat, thermally conductive strips in contact with the heat generating component across its entire length, said thermally conductive strip extending outside of the area covered by the electrically conductive material and core and in physical contact with the electrically conductive material, thereby receiving heat from the electrically conductive material, and

removing heat from a first end and a second end of each of the thermally conductive strips.

22. (Previously Presented) An electric motor, as in Claim 18, further comprising one or more thermocoolers adjacent to and touching the outer casing of the motor to conduct heat from the non-metallic thermally conductive strips and the metallic laminations forming the outer casing of the motor.

23. (New) The electric motor of Claim 18, wherein the circular, non-metallic, flat, thermally conductive disk has an anisotropic thermal conductivity.

24. (New) The electric motor of Claim 18, wherein the circular, non-metallic, flat, thermally conductive disk comprises a carbon-fiber composite.

25. (New) The electric motor of Claim 18, wherein the carbon-fiber composite conducts heat along the fibers of the carbon-fiber composite.

26. (New) The electric motor of Claim 18, wherein the circular, non-metallic, flat, thermally conductive disk comprises a high modulus carbon graphite laminate material.
27. (New) The electric motor of Claim 18, wherein the means for removing heat includes a thermally conducting potting compound.
28. (New) The electrical motor of Claim 18, wherein the conductive disk is anisotropic.
29. (New) The method according to Claim 19, wherein said placing a non-metallic thermally conductive strip includes placing a high modulus carbon graphite laminate thermally conductive strip.
30. (New) The method according to Claim 19, wherein said placing a non-metallic thermally conductive strip includes placing a carbon-fiber composite thermally conductive strip.
31. (New) The method according to Claim 19, wherein said placing a non-metallic thermally conductive strip includes placing a non-metallic thermally conductive strip having an anisotropic thermal conductivity.
32. (New) The method according to Claim 21, wherein said placing a non-metallic thermally conductive strip includes placing a high modulus carbon graphite laminate thermally conductive strip.
33. (New) The method according to Claim 21, wherein the thermally conductive strip includes a carbon-fiber composite.

34. (New) The method according to Claim 21, wherein said placing a non-metallic thermally conductive strip includes placing a non-metallic thermally conductive strip having an anisotropic thermal conductivity.

35. (New) A method for cooling an electrical device having layers of electrically conductive material wound onto a core and having a heat generating component, the method comprising:

placing one or more non-metallic, flat, thermally conductive strips having an anisotropic thermal conductivity in contact with the heat generating component across an entire length of the heat generating component, said thermally conductive strip extending outside of the area covered by the electrically conductive material and core and in physical contact with the electrically conductive material, thereby receiving heat from the electrically conductive material, and

removing heat from a first end and a second end of each of the thermally conductive strips.

36. (New) An electromagnetic device comprising:

a magnetic core;

at least one coil of electrically conductive material for conducting an electrical current therethrough, the coil having a plurality of turns;

at least one non-metallic, thermally conductive strip having anisotropic thermal conductivity, the strip positioned between adjacent turns of the coil for conducting heat generated in the coil away from the device.

37. (New) The electromagnetic device of Claim 36, wherein the at least one non-metallic, thermally conductive strip extends beyond a surface of the coil.

38. (New) The electromagnetic device of Claim 36, wherein the non-metallic, thermally conductive strip terminates at the surface of the coil or extends beyond a surface of the coil.
39. (New) The electromagnetic device of Claim 36, the at least one non-metallic, thermally conductive strip comprising a plurality of non-metallic, thermally conductive strips, each of the thermally conductive strips being positioned between adjacent turns of the coil, at least one of the strips extending beyond a surface of the coil.
40. (New) The electromagnetic device of Claim 36, at least one non-metallic, thermally conductive strip comprising a plurality of non-metallic, thermally conductive strips, each of the thermally conductive strips being positioned between adjacent turns of the coil, at least one of the strips extending beyond a surface of the coil.
41. (New) The electromagnetic device of Claim 36, the at least one non-metallic, thermally conductive strip extending beyond a surface of the coil transfers heat to surrounding air.
42. (New) The electromagnetic device of Claim 36, wherein the at least one non-metallic, thermally conductive strip extends beyond a surface of the coil transfers heat to a surrounding potting compound.
43. (New) The electromagnetic device of Claim 36, wherein the device is a motor.
44. (New) The electromagnetic device of Claim 36, wherein the device is a transformer.

45. (New) The electromagnetic device of Claim 36 further comprising an armature, wherein an electrical current in the coil forms an electromagnetic field that drives the armature when the electrical current is applied.
46. (New) The electromagnetic device of Claim 36, wherein the coil of electrically conductive material is wound on the magnetic core.
47. (New) The electromagnetic device of Claim 36, wherein the at least one non-metallic, thermally conductive strip comprises graphite.
48. (New) The electromagnetic device of Claim 36, wherein the at least one non-metallic thermally conductive strip comprises fibers having a highest thermal conductivity in a direction along the fibers.
49. (New) The electromagnetic device of Claim 36, wherein the non-metallic thermally conductive strip has a greater thermal conductivity than copper.
50. (New) The electromagnetic device of Claim 36, wherein the non-metallic thermally conductive strip has a thermal conductivity similar to copper or less than copper.
51. (New) The electromagnetic device of Claim 36, wherein the at least one non-metallic, thermally conductive strip includes a high modulus carbon graphite laminate.
52. (New) The electromagnetic device of Claim 36, wherein the at least one non-metallic, thermally conductive strip includes carbon graphite laminate.
53. (New) The electromagnetic device of Claim 36, wherein the non-metallic thermally conductive strip is flat.

54. (New) The electromagnetic device of Claim 36, wherein the non-metallic thermally conductive strips are non-magnetic.
55. (New) The electromagnetic device of Claim 36, wherein the non-metallic thermally conductive strip is not affected by Eddy currents.
56. (New) The electromagnetic device of Claim 36, wherein the non-metallic thermally conductive strip is less electrically conductive and more thermally conductive than aluminum.
57. (New) The electromagnetic device of Claim 36, further comprising a base plate heat sink, the non-metallic thermally conductive strips conducting heat from the coil to the base plate heat sink.